

Taylor, L, Rumney
L2
LSU Health Sciences Center, New Orleans, LA

Dr. Harvey Chim:
(LSUHSC, Department of Surgery; Touro, Manning Family Children's)

Objective Artificial-Intelligence Measurement of Facelift Outcomes from Published Photographs: A Surgeon-Validated Frontal Pipeline Applied to Deep Plane versus SMAS Rhytidectomy

Facelift (rhytidectomy) outcomes traditionally are evaluated through subjective assessment of pre- and postoperative photographs by both surgeons and patients. Artificial Intelligence (AI) has been used recently with its application to facial analysis; however, current approaches to facelift assessments largely focus on apparent-age estimation rather than reproducible, quantitative measurement of postoperative results. Objective analysis of facial geometry and symmetry may provide a standardized method for evaluating surgical outcomes, as well as comparing changes produced by different facelift techniques.

The primary objective of this study is to develop and validate a hybrid AI-assisted pipeline that is capable of quantitatively evaluating facelift outcomes using pre- and postoperative frontal photographs. Specific features of interest include jowl reduction, jawline definition, facial symmetry, wrinkle reduction, cervicomental angle, and lower facial proportions. Additional objectives include testing if the pipeline agrees with expert surgeon evaluations and applying the outcomes to compare postoperative changes between deep plane and superficial musculoaponeurotic system (SMAS) facelift techniques.

Published studies containing frontal pre- and postoperative photographs of patients that underwent facelift surgery were identified and extracted from the published literature (PRISMA). Eligible image pairs were then put through a standardized screening to compare pairs based on factors including facial positioning, orientation, lighting, and image quality. A hybrid AI pipeline incorporating landmark-based geometric measurements and multimodal AI assessment was used to quantify changes in previously validated facelift-relevant facial features. A subset of images will be blindly evaluated by expert surgeons to assess agreement between AI-generated and surgeon assessments. The pipeline will also be applied to current image pairs that compare postoperative outcomes between deep plane and SMAS techniques.

The aim of this study is to establish a reproducible, objective approach to evaluating facelift outcomes from clinical photographs using a hybrid landmark plus multimodal large language model pipeline. Through the combination of quantitative facial measures generated from AI-assisted analysis and expert surgeon validation, this framework may complement traditional subjective assessment and improve the standardization of facelift outcome reporting. Applying this approach to deep plane and SMAS facelift techniques may also provide the foundation for future comparative research without asserting technique superiority.